

Amendments to the Claims

The listing of claims provided below will replace all prior versions, and listings, of claims in the application.

Listing of claims

1.-24. (Cancelled)

25. (Currently amended) A discoloration removal cleaning agent for at least one of a titanium building material and a titanium alloy building material, comprising:

a water-soluble inorganic acid salt of potassium fluoride in an amount of 0.5 to 5.0 wt%;

a composition including one of an organic acid and an organic acid salt in an amount of 2 to 15 wt%;

a surfactant in an amount of 2 to 10 wt%;

a hydrophilic oxygen-containing hydrocarbon solvent in an amount of 5 to 20 wt%; and
the remainder, water;

wherein the cleaning agent satisfies at least one of the following conditions:

(a) ~~the cleaning agent comprises one or more types of a thickener, and~~

(b) ~~a viscosity of the cleaning agent that is measured at a room temperature is
between about 100 mPa·s and 10,000 mPa·s.~~

26. (Currently amended) The discoloration removal cleaning agent according to claim 25,
wherein:

(e) the cleaning agent comprises one or more types of a ~~fluorocarbon~~
fluorocarbon resin and one or more types of a polishing material, and

- (4) the cleaning agent comprises one or more types of a discoloration inhibitor.

27. (Cancelled)

28. (Previously presented) The discoloration removal cleaning agent according to claim 25, wherein the composition includes at least one of an formic acid, an oxalic acid, a citric acid, a malic acid, a lactic acid, a tartaric acid, a succinic acid, a fumaric acid, a gluconic acid, a hydroxybutyric acid, an ethylenediaminetetraacetic acid, a hydroxyethylenediaminetetraacetic acid, a diethylenetriaminopentaacetic acid, a hydroxyethanediphosphonic acid, and a particular salt.

29. (Previously presented) The discoloration removal cleaning agent according to claim 28, wherein the particular salt includes at least one of a sodium salt, a potassium salt and an ammonium salt.

30. (Cancelled)

31. (Previously presented) The discoloration removal cleaning agent according to claim 25, wherein a surfactant has a hydrophilic-lipophilic balance value of at least 12.

32. (Previously presented) The discoloration removal cleaning according to claim 25, wherein the composition is at least one of anionic surfactants and nonionic surfactants.

33. (Previously presented) The discoloration removal cleaning according to claim 32, wherein anionic surfactants include at least one of polyoxyethylenealkyl ether acetic acids, sodium salts thereof, polyoxyethylenealkyl ether phosphoric acids and sodium salts thereof, dialkylsulfosuccinic acids and sodium salts thereof.

34. (Previously presented) The discoloration removal cleaning according to claim 32, wherein nonionic surfactants include polyoxyethylenealkyl ethers, polyoxyethylenealkylallyl ethers and polyoxyethylenepolyoxypropylenealkyl ethers.

35. (Cancelled)

36. (Previously presented) The discoloration removal cleaning agent according to claim 25, wherein the hydrophilic oxygen-containing hydrocarbon is at least one of ethylene glycol, polyethylene glycol, propylene glycol, lower molecular weight polypropylene glycol, hexylene glycol, 1,3-butanediol, glycerin, methyldiglycol, methyltriglycol, ethyldiglycol, ethyltriglycol, butyldiglycol, butyltriglycol and N-methylpyrrolidone.

37. (Cancelled)

38. (Currently amended) The discoloration removal cleaning agent according to claim ~~25~~ 51, wherein the thickener is at least one of polyvinyl alcohol, methyl cellulose, hydroxyethyl cellulose, guar gum, xanthan gum, carboxyvinyl polymer, polyethylene oxide and polyvinylpyrrolidone.

39. (Currently amended) The discoloration removal cleaning agent according to claim 25 51, wherein a content of the thickener is about 0.2-1.5 wt%.

40. (Currently amended) The discoloration removal cleaning agent according to claim 25, ~~wherein the discoloration inhibitor is~~ further comprising a discoloration inhibitor which is at least one of mercaptobenzothiazole-based inhibitors, triazole-based inhibitors, imidazole-based inhibitors and thiourea-based discoloration inhibitors.

41. (Previously presented) The discoloration removal cleaning agent according to claim 40, wherein a content of the discoloration inhibitor is about 0.1-1.5 wt%.

42. (Currently amended) The discoloration removal cleaning agent according to claim 25, ~~wherein the fluoracarbon resin~~ further comprising a fluorocarbon resin which is at least one of polytetrafluoroethylene, polytetrafluoroethylene-hexafluoropropylene copolymer and polyvinylidene fluoride.

43. (Currently amended) The discoloration removal cleaning agent according to claim 42, wherein a content of the ~~fluoracarbon~~ fluorocarbon resin is about 0.3-2.0 wt%.

44. (Currently amended) The discoloration removal cleaning agent according to claim 25, ~~wherein the polishing material~~ further comprising a polishing material which is at least one of diamond, emery, garnet, corundum, ruby, silica sand, silicon carbide, alundum, cerium oxide, zirconium oxide, γ -alumina and chromium oxide.

45. (Previously presented) The discoloration removal cleaning agent according to claim 44, wherein a content of the polishing material is about 10-30 wt%.

46. (Currently amended) A discoloration removal cleaning method for a particular material which is at least one of a titanium building material and a titanium alloy building material, comprising the steps of:

- a) coating discolored sections of the particular material with a discoloration removal cleaning agent, the cleaning agent including a water-soluble inorganic acid salt of potassium fluoride in an amount of 0.5 to 5.0 wt %, a composition including one of an organic acid and an organic acid salt in an amount of 2 to 15 wt %, a surfactant in an amount of 2 to 10 wt %, a hydrophilic oxygen-containing hydrocarbon solvent in an amount of 5 to 20 wt %, and the remainder, water;
- b) allowing the coated sections to stand for a predetermined time period; and
- c) removing the cleaning agent by water washing the coated sections.

47. (Previously presented) The discoloration removal cleaning method according to claim 46, wherein, after step (b), step (c) is performed by at least one of high-pressure water washing at approximately 30-100 kg/cm² and approximately 10-50 L/min, and low-pressure spray water washing that is at most approximately 10 kg/cm² and approximately 5-30 L/min.

48. (Previously presented) The discoloration removal cleaning method according to claim 47, further comprising the step of:

- d) after steps (a) and (b) and before step (c), polishing the coated section, if necessary.

49. (Previously presented) The discoloration removal cleaning method according to claim 48, wherein step (c) is performed by water washing after step (d).

50. (Previously presented) The discoloration removal cleaning method according to claim 46, wherein a coating coverage of the discoloration removal cleaning agent performed in step (a) is about 50-200 g/m².

51. (New) The discoloration removal cleaning agent according to claim 25, wherein said cleaning agent satisfies either or both of the following conditions:

said cleaning agent comprises one or more types of thickener; and

the viscosity of said cleaning agent, measured at room temperature with a Brookfield viscometer, is 100-10,000 mPa.s.

52. (New) The discoloration removal cleaning agent according to claim 25, wherein said discoloration removal cleaning agent has a pH of 4.0 to 5.5.

53. (New) The discoloration removal cleaning method according to claim 46, wherein said discoloration removal cleaning agent has a pH of 4.0 to 5.5.